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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/643,179

08/18/2003

Gregory C. Copeland

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TEXAS INSTRUMENTS INCORPORATED

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EXAMINER

ETTEHADIEH, ASLAN

ART UNIT

PAPER NUMBER

2611

DATE MAILED: 10/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/643,179

Applicant(s)

COPELAND, GREGORY C.

Examiner

Aslan Ettehadieh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 11-21, 24-33 and 35-38 is/are rejected.
- 7) ☒ Claim(s) 8, 10, 22, 23 and 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>5/13/04 8/18/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 4 recites the limitation "a cancellation pulse" in at least one cancellation pulse generator, for producing a cancellation pulse corresponding to the identified peak location and the corresponding filter value. There is insufficient antecedent basis for this limitation in the claim. Is this cancellation pulse different than the claim "a cancellation pulse" in claim 1 or is it a second cancellation pulse or is it another cancellation pulse or etc.

3. Claim 28 recites replete with a numerous 35 U.S.C. 112 second paragraph problems. A few examples are provided here: the limitation "the" in the symbol stream. There is insufficient antecedent basis for this limitation in the claim. Does applicant mean a symbol stream, the digital symbol stream, etc. Also, the limitation "the" in "the sequence" There is insufficient antecedent basis for this limitation in the claim

Applicant's attention for carefully reviewing pending claims for such other indefiniteness.

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1, 4, 5, 9 – 11, 15, 18, 19, 24, 25 are rejected under 35 U.S.C. 102(a) as being anticipated by Hunton (US 2002/0006169).
5. Regarding claim 1, Hunton discloses an integrated circuit for compressing peak sample values in spread spectrum signals, comprising: a plurality of peak detection and cancellation circuits arranged in a sequence, a first peak detection and cancellation circuit having an input coupled to receive a spread spectrum symbol stream, at least a second peak detection and cancellation circuit having an input coupled to the output of a preceding peak detection and cancellation circuit in the sequence, each peak detection and cancellation circuit for applying a cancellation pulse to a received symbol stream responsive to detecting a peak amplitude in the received symbol stream exceeding a threshold, and for presenting a compressed symbol stream including the received symbol stream and cancellation pulse at its output (figure 2 element 12, figures 3 – 5, 8, 15 – 18, paragraphs 19 – 20, 55 – 56, 61 – 62, 79 – 84; where element 12 of figure 2 is shown as figure 3, where element 50 of figure 3 is shown as figures 4, 5, and 8, and where element 50 of figure figures 4, 5, and 8 are shown as figures 15 – 18, and where reduced is being interpreted as compressed)
6. Regarding claim 4, Hunton discloses wherein at least one of the plurality of peak detection and cancellation circuits comprises: a peak detector circuit, for identifying a peak location and a filter value corresponding to an amplitude at the peak location (figure 2, figure 4 elements 54, 56, 58, paragraphs 79 – 84); at least one cancellation

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pulse generator, for producing a cancellation pulse corresponding to the identified peak location and the corresponding filter value (figure 2, figure 4 elements 54, 56, 58, paragraphs 79 – 84); a delay stage for delaying the received symbol stream (figure 2, figure 4 element 52, paragraphs 62 – 63); and an adder, for combining the delayed received symbol stream and the cancellation pulse (figure 2, figure 4 element 60, paragraphs 62 – 63).

7. Regarding claim 18, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claim 4 above and therefore, it is rejected as in considering the aforementioned rejection for the apparatus claim 4.

8. Regarding claim 5, Hunton discloses wherein the peak detector circuit comprises an interpolating circuit, for generating a curve-fitting estimate of values near a sample point (figure 15 element 98, paragraph 79); an evaluation circuit, for determining the peak location from the curve-fitting estimate (figure 15 element 102, paragraph 79); a value computation circuit, for evaluating the amplitude at the peak location (figure 15 element 108, paragraph 79); a qualifier, for comparing the evaluated amplitude against a threshold value (figure 15 element 106, paragraph 79); and a filter generator, for producing the filter value from the evaluated amplitude (figure 15 elements 112, 114, paragraph 79).

9. Regarding claim 19, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claim 5 above and

therefore, it is rejected as in considering the aforementioned rejection for the apparatus claim 5.

10. Regarding claim 9, Hunton discloses the qualifier is also for issuing a qualifying signal for a first sample point responsive to the evaluated amplitude of the first sample point exceeding a threshold value in combination with no subsequent sample points in a selected interval having a larger evaluated amplitude than that of the first sample point (figure 15 element 106, paragraph 79).

11. Regarding claim 10, Hunton discloses wherein the at least one of the plurality of peak detection and cancellation circuits comprises a plurality of cancellation pulse generators (figure 2, figure 4 elements 54, 56, 58, paragraphs 79 – 84).

12. Regarding claim 11, Hunton discloses wherein each of the plurality of cancellation pulse generators comprises: a look-up table memory for storing a plurality of FIR pulse coefficients (paragraphs 16, 61 – 62); computational circuitry, coupled to the look-up table memory and to the peak detector circuit, for producing a data stream corresponding to the combination of the FIR pulse coefficients with an offset corresponding to the peak location (paragraphs 16 – 20); and gain scaling circuitry, for scaling the data stream responsive to the filter value from the filter generator of the peak detector circuit (paragraphs 16, 20, 39, 61, 69 – 71, 83).

13. Regarding claim 25, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claim 11 above and therefore, it is rejected as in considering the aforementioned rejection for the apparatus claim 11.

14. Regarding claim 15, Hunton discloses a method of transmitting a spread spectrum communications signal, comprising the steps of: applying at least one peak compression pulse to the spread spectrum signal at a first peak sample point, the magnitude of the signal at the first peak sample point exceeding a peak qualifying threshold, to produce a peak-compressed symbol stream; repeating, at least once, the applying step on the peak-compressed symbol stream (figure 2 element 12, figures 3 – 5, 8, 15 – 18, paragraphs 19 – 20, 55 – 56, 61 – 62, 79 – 84; where element 12 of figure 2 is shown as figure 3, where element 50 of figure 3 is shown as figures 4, 5, and 8, and where element 50 of figure figures 4, 5, and 8 are shown as figures 15 – 18, and where reduced is being interpreted as compressed); amplifying an analog modulated signal corresponding to a peak-compressed symbol stream from the last of the repeated applying steps to produce the signal to be transmitted (paragraphs 3, 9, 21, 56, figures 2 – 5, 8, 15 – 18; where the power amplifier disclosed would be after element 26 of figure 2 and before the transmitter as is well known in the art at the time the invention was made).

15. Regarding claim 24, Hunton discloses wherein the step of producing a cancellation pulse is performed within each applying step simultaneously for a plurality of identified peak locations in the symbol stream (figure 2, figure 4 elements 54, 56, 58, paragraphs 79 – 84).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view of Hunton (hereinafter Hunton2 US 2002/0196839) in view of Hongo et al. (US 6931239).

17. Regarding claim 2, Hunton does not disclose an output limiter, coupled to the output of the last of the peak detection and cancellation circuits in the sequence, for reducing residual peak amplitudes in the compressed symbol stream from the last of the peak detection and cancellation circuits in the sequence.

In the same field of endeavor, however, Hunton2 discloses coupled to the output of the last of the peak detection and cancellation circuits in the sequence, for reducing residual peak amplitudes in the compressed symbol stream from the last of the peak detection and cancellation circuits in the sequence (paragraphs 8 – 9, 24).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use coupled to the output of the last of the peak detection and cancellation circuits in the sequence, for reducing residual peak amplitudes in the compressed symbol stream from the last of the peak detection and cancellation circuits in the sequence as taught by Hunton2 in the system of Hunton to provide a more accurate correction signal (paragraph 9).

In the same field of endeavor, however, Hongo discloses an output limiter (figure 1 element 1, figure 3 element 14, col. 7 line 15 – col. 8 line 16).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use an output limiter as taught by Hongo in the system of Hunton to better estimate the multi carrier signal (col. 8 lines 14 – 16).

18. Claims 3, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view of Hunton (hereinafter Hunton2 US 2002/0196839) in view of Rakib et al. (US 6426983).

19. Regarding claim 3, Hunton does not disclose a digital downsampler, for receiving the spread spectrum symbol stream and forwarding a subset of the symbols in the spread spectrum symbol stream to the input of the first of the peak detection and cancellation circuits in the sequence.

In the same field of endeavor, however, Hunton2 discloses receiving the spread spectrum symbol stream and forwarding a subset of the symbols in the spread spectrum symbol stream to the input of the first of the peak detection and cancellation circuits in the sequence (figure 6, paragraphs 58 – 61).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use receiving the spread spectrum symbol stream and forwarding a subset of the symbols in the spread spectrum symbol stream to the input of the first of the peak detection and cancellation circuits in the sequence as taught by Hunton2 in the system of Hunton to reduce peak power while providing less complexity (paragraph 19).

In the same field of endeavor, however, Rakib discloses a digital downsampler inputted to the first of the peak detection and cancellation circuits (figures 5, 10, col. 8 line 47 – col. 9 line 35).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use a digital downsampler inputted to the first of the peak detection and cancellation circuits as taught by Rakib in the system of Hunton to prevent aliasing (col. 9 lines 21 – 23).

20. Regarding claim 17, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claim 3 above and therefore, it is rejected as in considering the aforementioned rejection for the apparatus claim 3.

21. Claims 6, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view Allpress et al. (US 6496546).

22. Regarding claim 6, Hunton does not disclose the interpolating circuit comprises a Farrow filter bank.

In the same field of endeavor, however, Allpress discloses the interpolating circuit comprises a Farrow filter bank (col. 7 line 48 – col. 8 line 9).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use the interpolating circuit comprises a Farrow filter bank as taught by Allpress in the system of Hunton to provide an option of continuously adjustable resample ratio.

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23. Regarding claim 20, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claim 6 above and therefore, it is rejected as in considering the aforementioned rejection for the apparatus claim 6.

24. Claims 7, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view Muegge et al. (US 2004/0052095).

25. Regarding claim 7, Hunton does not disclose the evaluation circuit is a binary search function.

In the same field of endeavor, however, Muegge discloses the evaluation circuit is a binary search function (paragraphs 60, 64).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use the evaluation circuit is a binary search function as taught by Muegge in the system of Hunton to better regulate output signal levels (paragraphs 60, 64).

26. Regarding claim 21, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claim 7 above and therefore, it is rejected as in considering the aforementioned rejection for the apparatus claim 7.

27. Claims 12,13, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169).

28. Regarding claim 12, Hunton is not specific about wherein the filter value comprises in-phase and quadrature-phase components; and wherein the output of the

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gain scaling circuitry comprises in-phase and quadrature-phase components, however, it would have been obvious to one skilled in the art at the time of invention was made to use in-phase and quadrature-phase components in the system of Hunton because it is well known to use I and Q signals for measurement, testing, and/or calibration.

29. Regarding claim 26, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claim 12 above and therefore, it is rejected as in considering the aforementioned rejection for the apparatus claim 12.

30. Regarding claim 13, Hunton discloses each of the plurality of cancellation pulse generators comprises: finite impulse response circuitry, for producing a data stream corresponding to an offset corresponding to the peak location (paragraphs 61, 72, 73, 75). Hunton is not specific about the use of an infinite impulse response however, it would have been obvious to one skilled in the art at the time of invention was made to use infinite impulse response in the system of Hunton because IIR filters are an order of magnitude more efficient than an equivalent FIR filter, also IIR will do the same work with fewer components, and fewer components translate directly to less money.

31. Regarding claim 27, the steps claimed as method is nothing more than restating the function of the specific components of the apparatus as claim 13 above and therefore, it is rejected as in considering the aforementioned rejection for the apparatus claim 13.

32. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view of Hunton (hereinafter Hunton2 US 2002/0196839).

33. Regarding claim 16, Hunton does not disclose before the amplifying step, output limiting the peak-compressed symbol stream from the last of the repeated applying steps..

In the same field of endeavor, however, Hunton2 discloses before the amplifying step, output limiting the peak-compressed symbol stream from the last of the repeated applying steps (paragraphs 8 – 9, 24).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use before the amplifying step, output limiting the peak-compressed symbol stream from the last of the repeated applying steps as taught by Hunton2 in the system of Hunton to provide a more accurate correction signal (paragraph 9).

34. Claims 28, 30, 31, 35 – 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view of Hunton (hereinafter Hunton2 US 2002/0196839) in further view of Motoyoshi (US 2001/0055294).

35. Regarding claim 28, Hunton discloses a wireless base station for transmitting spread spectrum signals corresponding to a plurality of communications channels, comprising: generating a signal over a plurality of channels, the signal being arranged in the form of a digital symbol stream (paragraphs 3, 6, 12, abstract figure 2); a plurality of peak detection and cancellation circuits arranged in a sequence, a first peak detection and cancellation circuit having an input coupled to receive the symbol stream, at least a second peak detection and cancellation circuit having an input coupled to the output of a preceding peak detection and cancellation circuit in the sequence, each peak

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detection and cancellation circuit for applying a cancellation pulse to a received symbol stream responsive to detecting a peak amplitude in the received symbol stream exceeding a threshold, and for presenting a compressed symbol stream including the received symbol stream and cancellation pulse at its output (figure 2 element 12, figures 3 – 5, 8, 15 – 18, paragraphs 19 – 20, 55 – 56, 61 – 62, 79 – 84; where element 12 of figure 2 is shown as figure 3, where element 50 of figure 3 is shown as figures 4, 5, and 8, and where element 50 of figure figures 4, 5, and 8 are shown as figures 15 – 18, and where reduced is being interpreted as compressed); a digital-to-analog converter for converting the compressed symbol stream to an analog signal (figure 2 element 36, 24); modulation circuitry for producing a modulated signal, corresponding to the analog signal, at a carrier frequency (figure 2 element 26); and a power amplifier, for amplifying the modulated signal for transmission (paragraphs 3, 9, 21, 56, figures 2 – 5, 8, 15 – 18; where the power amplifier disclosed would be after element 26 of figure 2 and before the transmitter as is well known in the art at the time the invention was made). Hunton does not disclose at least one coder/decoder for generating a spread spectrum signal.

In the same field of endeavor, however, Hunton² discloses a similar invention to the invention of Hunton but the invention shows it is done in spread spectrum (figure 6).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use the above in spread spectrum as taught by Hunton² in the system of Hunton to provide for more diversity.

In the same field of endeavor, however, Motoyoshi discloses at least one coder/decoder for generating a spread spectrum signal over a plurality of channels, the

signal being arranged in the form of a digital symbol stream (figure 3, paragraphs 3, 18, 31, 35 – 37).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use at least one coder/decoder for generating a spread spectrum signal over a plurality of channels, the signal being arranged in the form of a digital symbol stream as taught by Motoyoshi in the system of Hunton to more accurately assign spreading depending on the channel traffic (paragraph 18).

36. Regarding claim 30, Hunton discloses all limitations of claim 30 as analyzed in claim 4 above.

37. Regarding claim 31, Hunton discloses all limitations of claim 31 as analyzed in claim 5 above.

38. Regarding claim 35, Hunton discloses all limitations of claim 35 as analyzed in claim 9 above.

39. Regarding claim 36, Hunton discloses all limitations of claim 36 as analyzed in claim 11 above.

40. Regarding claim 37, Hunton discloses all limitations of claim 37 as analyzed in claim 12 above.

41. Regarding claim 38, Hunton discloses all limitations of claim 38 as analyzed in claim 13 above.

42. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view of Hunton (hereinafter Hunton2 US 2002/0196839) in view of Motoyoshi (US 2001/0055294) in further view of Hongo et al. (US 6931239).

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43. Regarding claim 29, Hunton discloses all limitations of claim 29 as analyzed in claim 2 above.

44. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view of Hunton (hereinafter Hunton2 US 2002/0196839) in view of Motoyoshi (US 2001/0055294) in further view of Allpress et al. (US 6496546).

45. Regarding claim 32, Hunton discloses all limitations of claim 32 as analyzed in claim 6 above.

46. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hunton (US 2002/0006169) in view of Hunton (hereinafter Hunton2 US 2002/0196839) in view of Motoyoshi (US 2001/0055294) in further view of in view of Muegge et al. (US 2004/0052095).

Regarding claim 33, Hunton discloses all limitations of claim 33 as analyzed in claim 7 above.

Allowable Subject Matter

47. Claims 8, 10, 22, 23, 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aslan Ettehadieh whose telephone number is (571) 272-8729. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aslan Ettehadieh
Examiner
Art Unit 2637

AE


KHAI TRAN
PRIMARY EXAMINER